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PTO/SB/21(09-06)

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## TRANSMITTAL FORM

(to be used for all correspondence after initial filing)

Application Number	10/782,098
Filing Date	February 19, 2004
First Named Inventor	Carmen Flosbach
Group Art Unit	1796
Examiner Name	Rabon A. Sargent

Total Number of Pages in This Submission

Attorney Docket Number

FA1224 US NA

### ENCLOSURES (check all that apply)

<input checked="" type="checkbox"/> Fee Transmittal Form  <input type="checkbox"/> Fee Attached	<input type="checkbox"/> Drawing(s)  <input type="checkbox"/> Licensing-related Papers	<input type="checkbox"/> After Allowance Communication to TC  <input type="checkbox"/> Appeal Communication to Board of Appeals and Interferences
<input type="checkbox"/> Amendment / Response  <input type="checkbox"/> After Final <input type="checkbox"/> Affidavits/declaration(s)	<input type="checkbox"/> Petition  <input type="checkbox"/> Petition to Convert to a Provisional Application	<input checked="" type="checkbox"/> Appeal Communication to TC (Appeal Brief)  <input type="checkbox"/> Proprietary Information
<input type="checkbox"/> Extension of Time Request (1 mo.)	<input type="checkbox"/> Power of Attorney, Revocation Change of Correspondence Address	<input type="checkbox"/> Status Letter
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<input type="checkbox"/> Response to Missing Parts under 37 CFR 1.52 or 1.53	<input type="checkbox"/> Landscape Table on CD	
Remarks		

### SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT

Firm Name	Potter Anderson & Corroon LLP		
Signature			
Printed Name	Rakesh H. Mehta		
Date	December 31, 2007	Reg. No.	50,224

### CERTIFICATE OF TRANSMISSION/MAILING

I hereby certify that this correspondence is being sent via first class mail to the USPTO or deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to: Mail Stop Appeal Brief-Patent, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on the date shown below:

Signature	Ellen M. Godfrey		
Typed or printed name		Date	December 31, 2007

This collection of information is required by 37 CFR 1.5. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to 2 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

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JAN 02 2008

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# FEE TRANSMITTAL for FY 2008

Patent fees are subject to annual revision.

 Applicant Claims small entity status. See 37 CFR 1.27

TOTAL AMOUNT OF PAYMENT (\$ 510.00)

Complete if Known

Application Number	10/782,098
Filing Date	February 19, 2004
First Named Inventor	Carmen Flosbach
Examiner Name	Rabon A. Sergent
Group / Art Unit	1796
Attorney Docket No	FA1224 USNA

## METHOD OF PAYMENT (check all that apply)

 Check  Credit card  Money Order  Other  None Deposit Account:

Deposit Account Number	501447
Deposit Account Name	Potter Anderson & Corroon LLP

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- Charge fee(s) indicated below  Credit any overpayments  
 Charge any additional fee(s) during the pendency of this application  
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## FEE CALCULATION

## 1. BASIC FILING FEE

Large Entity | Small Entity

Fee Code	Fee (\$)	Fee Code	Fee (\$)	Fee Description	Fee Paid
1011	1030	2011	515	Utility filing fee	
1002	440	2002	220	Design filing fee	
1013	680	2013	340	Plant filing fee	
1004	1440	2004	720	Reissue filing fee	
1005	210	2005	105	Provisional filing fee	

SUBTOTAL (1) (\$)

## 2. EXTRA CLAIM FEES

Total Claims	-20	=	Extra Claims	X	Fee from below	Fee Paid
Independent Claims	-3	=		X	50	
Multiple Dependent				X	200	

Large Entity	Small Entity

X 360 =

Fee Code	Fee (\$)	Fee Code	Fee (\$)	Fee Description
1202	50	2202	25	Claims in excess of 20
1201	200	2201	100	Independent claims in excess of 3
1203	360	2203	180	Multiple dependent claim, if not paid
1204	210	2204	105	** Reissue independent claims over original patent
1205	50	2205	25	** Reissue claims in excess of 20 and over original patent

SUBTOTAL (2) (\$)

\*\*or number previously paid, if greater; For Reissues, see above

3. ADDITIONAL FEES 1401		Large Entity		Small Entity		Fee Description	Fee Paid
Fee Code	Fee (\$)	Fee Code	Fee (\$)	Fee Code	Fee (\$)		
1051	130	2051	65	1053	130	Surcharge – late filing fee or oath	
1052	50	2052	25	1812	2,520	Surcharge – late provisional filing fee or cover sheet	
1053	130	1812	2,520	1804	920*	Non-English specification	
1804	920*	1804	920*	1805	1,840*	Request for ex parte reexamination	
1805	1,840*	1805	1,840*	1251	120	Requesting publication of SIR prior to Examiner action	
1251	120	2251	60	1252	460	Requesting publication of SIR after Examiner action	
1252	460	2252	230	1253	1050	Extension for reply within first month	
1253	1050	2253	525	1254	1,640	Extension for reply within second month	
1254	1,640	2254	820	1255	2,230	Extension for reply within third month	
1255	2,230	2255	1,115	1401	510	Extension for reply within fourth month	
1401	510	2401	255	1402	510	Notice of Appeal	
1402	510	2402	255	1403	1,030	Filing a brief in support of an appeal	510.00
1403	1,030	2403	515	1451	1,510	Request for oral hearing	
1451	1,510	1451	1,510	1452	510	Petition to institute a public use proceeding	
1452	510	2452	255	1453	1,540	Petition to revive – unavoidable	
1453	1,540	2453	770	1501	1,440	Petition to revive – unintentional	
1501	1,440	2501	720	1502	820	Utility issue fee (or reissue)	
1502	820	2502	410	1503	1,130	Design issue fee	
1503	1,130	2503	565	1464	130	Plant issue fee	
1464	130	1464	130	1807	50	Petitions requiring the petition fee set forth in 37 CFR 1.17(h) (Group III)	
1807	50	1807	50	1806	180	Processing fee for provisional applications 37 CFR 1.17(g)	
1806	180	1806	180	8021	40	Submission of Information Disclosure Stmt	
8021	40	8021	40	1809	810	Recording each patent assignment per property (times number of properties)	
1809	810	2809	405	1810	810	Filing a submission after final rejection (37 CFR § 1.129(a))	
1810	810	2810	405	1801	810	For each additional invention to be examined (37 CFR § 1.129(b))	
1801	810	2801	405	1802	900	Request for Continued Examination (RCE)	
1802	900	1802	900	Request for expedited examination of a design application			

Other fee (specify)

\*Reduced by basic filing fee paid.

\*Reduced by Basic Filing Fee Paid

SUBTOTAL (3)

(\$ 510.00)

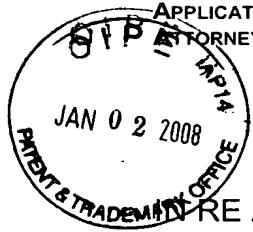
## SUBMITTED BY

Complete (if applicable)

Name (Print/Type)	Rakesh H. Mehta	Registration No. Attorney/Agent)	50,224	Telephone	302-984-6132
Signature				Date	December 31, 2007

This collection of information is required by 37 CFR 1.136. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 30 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

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APPLICATION No.: 10/782,098  
ATTORNEY DOCKET No.: FA 1224 US NA

PATENT  
GROUP ART UNIT 1796

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

RE APPLICATION OF:  
**CARMEN FLOSBACH, ET AL.**

APPLICATION NO.:  
**10/782,098**

GROUP ART UNIT:  
**1796**

FILED:  
**FEBRUARY 19, 2004**

EXAMINER:  
**RABON A. SERGENT**

FOR:  
**PROCESS FOR PRODUCTION OF  
POLYURETHANE DI(METH)ACRYLATES**

ATTORNEY DOCKET NO.:  
**FA1224 US NA**

**APPEAL BRIEF UNDER 37 C.F.R. §§ 1.191 & 41.37**

MAIL STOP APPEAL BRIEF—PATENTS  
COMMISSIONER FOR PATENTS  
P.O. Box 1450  
ALEXANDRIA, VA 22313-1450

Sir:

Appellants submit the following Appeal Brief in support of the Appeal filed on October 24, 2007, appealing the Final Office Action dated July 18, 21007, and the Advisory Action dated October 15, 2007. Appellants file this Appeal Brief pursuant to 37 C.F.R. §§ 1.191, 41.37(c), & 41.37 generally, and MPEP § 1205.01, ¶ 6.

Appellants also submit the filing fee in the amount of \$510.00 for this Appeal Brief in accordance with 37 C.F.R. § 41.20(b)(2). Please charge said fee to Deposit Account No. 501447 (Potter Anderson & Corroon, LLP).

01/03/2008 SDENB0B3 00000015 581447 10782098  
01 FC:1402 510.00 DA

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**I. REAL PARTY IN INTEREST**

The real party in interest is the Assignee of the case, E. I. DuPont de Nemours & Company, a Delaware corporation (*hereinafter*, "DuPont").

**II. RELATED APPEALS AND INTERFERENCES**

None known to Appellants.

**III. STATUS OF THE CLAIMS**

Appellants canceled Claims 2-3, 5-6, and 8-9. Claims 1, 4, 7, and 10 remain in the case. The Examiner rejected Claims 1, 4, 7, and 10 under 35 U.S.C. § 103(a). This rejection is the subject of this appeal. The Examiner has not allowed any claims.

**IV. STATUS OF AMENDMENT**

There were no amendments after the final rejection, so there are no "pending" amendments.

**V. SUMMARY OF CLAIMED SUBJECT MATTER**

Generally, the present application describes a process for producing polyurethane di(meth)acrylates, the polyurethane di(meth)acrylate compositions, powder coating compositions comprising such polyurethane di(meth)acrylates and substrates coated with such powder coating compositions. In the claims under consideration, Claim 1 is the only independent claim.

**Claim 1**

Claim 1 relates to a process for the production of polyurethane di(meth)acrylates in which 1,6-hexane diisocyanate is reacted, without solvent and without subsequent purification operations, with a diol component, and with hydroxyethylacrylate or hydroxypropylacrylate, in the molar ratio  $x : (x-1) : 2$ , wherein  $x$  means any desired value from 2 to 5 (Page 2, Line 31, to Page 3, Line 2) and

wherein the diol component is selected from the group consisting of:

- (a) combinations of 20 to 80 mol% hydrogenated bisphenol A with 80 to 20 mol% 1,10-decanediol (Page 4, Lines 1-3),
- (b) combinations of 20 to 80 mol% hydrogenated bisphenol A with 80 to 20 mol% 1,6-hexanediol (Page 4, Lines 3-4),
- (c) combinations of 60 to 90 mol% neopentyl glycol with 40 to 10 mol% 1,6-hexanediol (Page 4, Lines 4-5),

and

- (d) three-component combinations comprising in each case 10 to 50 mol% 1,3-propanediol, 10 to 50 mol% 1,5-pentanediol and 10 to 50 mol% 1,6-hexanediol, wherein the mol percentages add up to 100 mol% in each of the combinations (Page 4, Lines 6-9).

## **VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL**

The rejection ground to be reviewed on appeal is the rejection of Claims 1, 4, 7, and 10 under 35 U.S.C. § 103(a), as obvious over WO 01/25359, equivalent to U.S. Patent No. 6,825,241 to Blum, *et al.* (*hereinafter*, “Blum”).

## **VII. ARGUMENT**

### **(A) REJECTION UNDER 35 U.S.C. § 103(A)-CLAIMS 1, 4, 7, & 9**

The Examiner rejected Claims 1, 4, 7, and 10 under 35 U.S.C. § 103(a) as being obvious over Blum. Appellants respectfully traverse and provide traversal arguments to the Examiner’s Final Rejection and Advisory Action.

Specifically, according to the Examiner, Blum discloses polyurethane diacrylates and powder coatings derived from the polyurethane diacrylates, wherein the

polyurethane diacrylates are produced from the reaction of hexane diisocyanate with ethylene glycol, butanediol, and hydroxyethyl acrylate in a claimed molar ratio range.

The Examiner further argued that although other mixtures of diols that specifically meet those claimed are not exemplified in Blum, it does disclose the use of other diol species that meet those claimed. Because, according to the Examiner, the diols exemplified in Blum are included within the listing of diols of the present invention, this listing essentially establishes the equivalency of the other diol species disclosed to those of the example. Accordingly, the Examiner asserts that it would have been *prima facie* obvious to utilize any of the disclosed diols in the form of blends in the production of polyurethane diacrylates, in accordance with the teachings of the example.

Appellants respectfully disagree with the Examiner's conclusion of obviousness.

From the Examiner's own assertion, Appellants combination diols are not disclosed by Blum. The Examiner only strives to assert equivalency of the non-disclosed diols and diol combinations in Blum with those disclosed in the present invention, because some of the Blum disclosed diols are also listed together with the combination diols of the present invention.

Appellants submit that evidence of secondary considerations must be taken into account by the Examiner before concluding obviousness. Factors considered as evidence of secondary considerations include: commercial success, long-felt but unresolved need, failure of others, recognition of problem, failed attempts to solve problem, teaching away by those skilled, unexpected results and superior properties (surprising result), etc.

Appellants submitted additional evidence of unexpected results and superior properties demonstrated by the compositions of the present invention. Particularly, the present invention compositions show unexpected and superior result—powder coating compositions with simultaneously improved acid resistance and scratch resistance.

Appellants submitted the unexpected results/superior properties evidence in a 132 Declaration by the inventor Ms. Carmen Flosbach in Response to the December 19, 2005 Office Action. Appellants attach the 132 Declaration in the Appendix.

Appellants also summarize and discuss the substantive information in the 132 Declaration below.

Appellants determined (1) Acid Resistance and (2) Scratch Resistance of the powder coatings samples of Examples 1-8, & 11 of the present invention. In the experiment, Appellants sprayed powder coating compositions in a layer thickness of 80 µm onto steel sheets coated with commercially available electro-deposition paint, filler, and base coat (flashed off). The compositions were subsequently melted for 10 min at 140°C (oven temperature). The coatings were cured by ultra-violet radiation of a radiation intensity of 500 mW/cm<sup>2</sup> and a radiation dose of 800 mJ/cm<sup>2</sup>.

(i) How Acid Resistance Test was Conducted

50 µl of 36% sulfuric acid were dropped onto the paint films for 30 minutes at intervals of one minute at 65°C.

Assessment: Destruction of the film after X (0 to 30) minutes.

(ii) How Scratch Resistance Test was Conducted

Appellants determined Scratch Resistance in terms of residual gloss of the samples after wash scratching. Residual gloss was measured in percent, that is, ratio of initial gloss of the clear coat surface to its gloss after wash scratching; gloss measurement in each case was performed at an angle of illumination of 20°. Wash-scratching was performed using an Amtec Kistler laboratory car wash system according to development of a standard laboratory test method for evaluating resistance of automotive top coats to car wash systems.

For comparison purposes, Appellants also prepared the resin according to Blum Example 5. Using this resin, a powder coating was prepared and applied according to the method used for Examples 1-11. Acid and Scratch Resistance were determined as described above. Acceptable Acid Resistance Number is greater than or equal to 10. Acceptable Scratch Resistance Number is greater than or equal

Example No.	Acid Resistance Number	Scratch Resistance Number (residual gloss, %)	Percent Improvement in Acid Resistance Number over Reference	ACCEPTABILITY
1	12	72	33%	YES
2	13	68	44%	YES
3	11	71	22%	YES
4	12	69	33%	YES
5	23	64	156%	YES
6	21	70	133%	YES
7 (comparison)	10	75		
8 (comparison)	22	60		
11	13	82	44%	YES
Blum Example 5	<b>9</b>	75		<b>NO</b>

to 60. A sample was judged as acceptable or not, based on both the acid resistance and scratch resistance.

Only Examples 1-6 and 11 of the present invention gave acceptable numbers for both Acid Resistance and Scratch Resistance. On the other hand, comparative Blum Example 5 showed poor Acid Resistance (values of  $\leq 10$ ) Number of "9". The samples prepared with the compositions of present invention improved acid resistance by about 22% to about 156% over the Blum reference. Thus, compositions of the present invention give superior results compared to the Blum reference compositions.

In response to the January 17, 2007 Office Action, Appellants also narrowed Claim 1 alkyl (meth)acrylates from hydroxy-C<sub>2</sub>-C<sub>4</sub>-alkyl (meth)acrylates to simply two—hydroxyethylacrylate and hydroxypropylacrylate. Inventor Dr. Flosbach also provided a second 132 Declaration in response to the May 31, 2006 Office Action. This Declaration is also attached in the Evidence Appendix. In this second 132 Declaration, Appellants performed Acid Resistance and Scratch Resistance Tests for Examples 1, 5, 6, and 11. For 1, 5, and 6, the hydroxy-C<sub>2</sub>-C<sub>4</sub>-alkyl (meth)acrylates component of the composition was switched from hydroxyethylacrylate to hydroxypropylacrylate. Similarly, for Example 11, the component was switched from hydroxypropylacrylate to hydroxyethylacrylate. In other words, Acid and Scratch Resistance Numbers for compositions comprising both components, hydroxyethylacrylate and hydroxypropylacrylate, were made available for Examples 1, 5, 6, and 11.

The data are summarized in the Table II below:

Example No.	Acid Resistance No.	Scratch Resistance No. (residual gloss, %)	Percent Improvement in Acid Resistance Number over Reference	ACCEPTABILITY
1 (HPA)	13	70	44%	YES
5 (HPA)	22	68	144%	YES
6 (HPA)	22	70	144%	YES
11 (HEA)	14	70	55%	YES
Blum Example 5	9	75		NO

Clearly, the Acid Resistance Numbers improved from about 44% to about 144% over the Blum reference example even when the hydroxyethylacrylate and hydroxypropylacrylate compositions were switched. For the hydroxy-C<sub>2</sub>-C<sub>4</sub>-alkyl (meth)acrylates component in Claim 1, Appellants claim only two compounds—hydroxyethylacrylate and hydroxypropylacrylate. And for both of these acrylates, Appellants have shown unexpected and superior, that is an improvement in acid

resistance while maintaining acceptable scratch resistance property of the coated samples.

In relation to the ranges in Claim 1, the Examiner noted that “a limited showing of criticality is insufficient to support a broadly claimed range.” Appellants do not disagree with the Examiner’s point, except that it does not apply to the present situation. Particularly, criticality of a range is only at issue where the range is needed to establish the nonobviousness of the invention. See MPEP § 2144.05(III). Here, Appellants have made no assertion, and require no assertion, that the ranges in Claim 1 are critical to the nonobviousness of the claim. The ranges are not critical to the *patentability* of the Claim 1 invention but rather are important to the *operability* of the invention. For example, Appellants’ Specification confirms the purpose of the Claim 1 ranges, at Page 2, Line 31–Page 3, Line 9. Appellants reproduce the paragraph below:

**In the process according to the invention, 1,6-hexane diisocyanate, diol component and hydroxyalkyl (meth)acrylate are reacted stoichiometrically with one another in the molar ratio x mol 1,6-hexane diisocyanate: (x-1) mol diol:2 mol hydroxyalkyl (meth)acrylate, wherein x means any desired value from 2 to 5, preferably from 2 to 4. At values of x>5, it is often necessary to use synthesis temperatures which are so high that there is a risk of free-radical polymerization during the synthesis and/or products are obtained which, with regard to use as powder coating binders, have excessively high melting points or ranges, for example, above 120°C. Moreover, it is, in general, not possible to achieve adequate crosslink density with powder coatings formulated with polyurethane di(meth)acrylates as binders that have been produced at x>5.**

Appellants list the potential operability problems when X is greater than 5:

- (i) risk of free-radical polymerization because of the need for higher synthesis temperatures;
- (ii) high melting points of the powder coating binders from X > 5 synthesis products; and
- (iii) lack of adequate cross-link density in powder coatings formulated with the polyurethane di(meth)acrylates with X > 5.

As discussed *supra*, Appellants previously submitted two 132 Declarations from inventor Dr. Carmen Flosbach under 37 C.F.R. § 1.132. According to the Examiner, the declarations are deficient because the examples of the declaration are not

commensurate in scope with the claims. Further, according to the Examiner, the claims in the present application "encompass fractional values of X and molar ratios of the diols that are not exemplified within the declaration." The Examiner further suggests that a relevant showing would be where X is equal to 2.5, that is when the hexane diisocyanate mole percent is 41.6%, because that is what the prior art exemplifies.

In the first 132 Declaration, Appellants prepared the resin in Example 5 of the Blum reference and compared it with those of the present invention by measuring its Acid and Scratch Resistance. As suggested above, the resins of the present invention showed unexpected results in terms of the scratch and acid resistance over the Blum resins. The resins described in the 132 Declaration were prepared with:

X value at 2	Example 1;
X value at 3	Examples 2-3, 5-8, & 11;
X value at 4	Example 4.

Thus, Appellants demonstrated at least the workability and the possibility of achieving superior results at:

X value at 2	that is hexane diisocyanate (HDI) mole percent at <u>40%</u> ;
X value at 3	that is HDI mole percent at <u>42.8%</u> ;
X value at 4	that is HDI mole percent at <u>44.4%</u> .

Appellants respectfully submit that, because data for HDI mole percent at 40%, 42.8% and 44.4% were submitted in the 132 Declarations, the process in which the value of X is 2.5, that is HDI mole percent of 41.6%, is commensurate with the scope of the claim.

Because Claims 4, 7, and 10 are dependent claims, which recite even further limitations to the claim that has already been traversed, Appellants rely upon the arguments presented above in rebuttal to the Examiner's assertion that Claims 4, 7, and 10 are obvious over Blum.

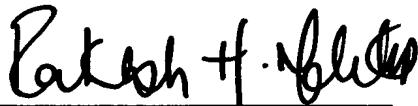
**VIII. CONCLUSION**

For the reasons set forth above, the Board of Patent Appeals and Interferences is respectfully requested to reverse the final rejection of pending Claims 1, 4, 7, and 10, and indicate allowability of all claims.

Please charge any fee due which is not accounted for to Deposit Account No. 501447 (Potter Anderson & Corroon, LLP).

Respectfully Submitted,

BY:



**RAKESH H. MEHTA, ESQUIRE**  
ATTORNEY FOR APPELLANTS  
REGISTRATION NO.: 50,224  
PHONE: 302-984-6089  
FAX: 302-658-1192

Date: December 31, 2007

CLAIMS APPENDIX

1. A process for the production of polyurethane di(meth)acrylates in which 1,6-hexane diisocyanate is reacted, without solvent and without subsequent purification operations, with a diol component and hydroxyethylacrylate or hydroxypropylacrylate, in the molar ratio  $x : (x-1) : 2$ , wherein  $x$  means any desired value from 2 to 5 and  
wherein the diol component is selected from the group consisting of combinations of
  - 20 to 80 mol% hydrogenated bisphenol A with 80 to 20 mol% 1,10-decanediol,
  - 20 to 80 mol% hydrogenated bisphenol A with 80 to 20 mol% 1,6-hexanediol,
  - 60 to 90 mol% neopentyl glycol with 40 to 10 mol% 1,6-hexanediol,  
andthree-component combinations comprising in each case 10 to 50 mol% 1,3-propanediol, 10 to 50 mol% 1,5-pentanediol and 10 to 50 mol% 1,6-hexanediol, wherein the mol percentages add up to 100 mol% in each of the combinations.
4. Polyurethane di(meth)acrylates produced using the process of claim 1.
7. Powder coating compositions containing the polyurethane di(meth)acrylates produced according to the process of claim 1 as binder.
10. A substrate coated with a layer of the powder coating composition according to claim 7.

**EVIDENCE APPENDIX**

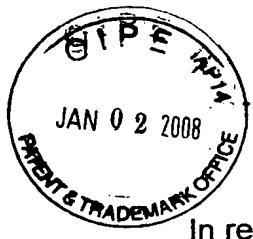
1. First Affidavit by Dr. Carmen Flosbach under 37 C.F.R. § 1.132 previously submitted with Response to the Office Action of December 19, 2005.
2. Second Affidavit by Dr. Carmen Flosbach under 37 C.F.R. § 1.132 previously submitted with Response to the Office Action of May 31, 2006.

APPLICATION No.: 10/782,098  
ATTORNEY DOCKET No.: FA 1224 US NA

PATENT  
GROUP ART UNIT 1796

**RELATED PROCEEDINGS APPENDIX**

None



PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:

FLOSBACH ET AL.

CASE NO: FA1224 US NA

SERIAL NO: 10/782,098

GROUP ART UNIT: 1711

FILED: FEBRUARY 19, 2004

EXAMINER: RABON A. SERGENT

FOR: PROCESS FOR PRODUCTION  
OF POLYURETHANE  
DI(METH)ACRYLATES

**DECLARATION UNDER 37 C.F.R. § 1.132**

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Sir:

I, Carmen Flosbach, declare that:

I am a citizen of the Federal Republic of Germany and reside at Marpe 41  
D-42287, Wuppertal, Germany.

I am an employee of E.I. du Pont de Nemours and Company ("DuPont").

I received a Ph.D. in organic heterocyclic chemistry from the University of  
Wuppertal, FRG. I have worked for DuPont from 1990 to the present in the field  
of resin development.

I am a technical expert in the field of paint coatings, and I am familiar with  
the above-referenced patent application, as well as the references cited therein.

The following are my remarks:

1. The May 31, 2006, Final Office Action indicated that claims 1, 4, 7, and 10 were rejected under 35 U.S.C. § 103(a) as being obvious over WO 01/25359. Therein, the Examiner asserted that the 132 Declaration submitted along with the Response to the December 19, 2005, Non-Final Office action was "deficient, because the examples of the declaration are not commensurate in scope with the claims."

2. I submit additional evidence of unexpected results of coatings made from the compositions of the invention.
3. The experiments described herein were conducted under my direction as follows:

Acid and scratch resistance of powder coatings were determined, wherein the powder coatings contained the diols of Examples 1, 5, 6, and 11 of the present application with the hydroxy-C2-C4-alkyl (meth)acrylate component changed from hydroxyethylacrylate to hydroxypropylacrylate in Examples 1, 5, and 6 and from hydroxypropylacrylate to hydroxyethylacrylate in Example 11. The respective powder clear coats were sprayed, in a layer thickness of 80 µm in each case, onto steel sheets coated with commercially available electro-deposition paint, filler, and base coat (flashed off) and melted for 10 min at 140 °C (oven temperature). The coating was cured by ultra-violet radiation corresponding to a radiation intensity of 500 mW/cm<sup>2</sup> and a radiation dose of 800 mJ/cm<sup>2</sup>.

(i) Acid Resistance Test

50 µl of 36% sulfuric acid were dropped onto the paint films for 30 minutes, at intervals of one minute, at 65 °C.

Assessment: Destruction of the film after X (0 to 30) minutes.

(ii) Scratch Resistance Test

Scratch resistance was determined in terms of residual gloss after wash scratching. Residual gloss was measured in percent (ratio of initial gloss of the clear coat surface to its gloss after wash scratching; gloss measurement in each case was performed at an angle of illumination of 20°). Wash-scratching was performed using an Amtec Kistler laboratory car wash system [c.f. Th. Klimmasch and Th. Engbert, Entwicklung einer einheitlichen Laborprüfmethode für die Beurteilung der Waschstraßenbeständigkeit von Automobil-Decklacken] according to development of a standard laboratory test

method for evaluation of resistance of automotive top coats to car wash systems.<sup>1</sup>

Acceptable Acid Resistance number was greater than 10. Acceptable Scratch Resistance number was greater than 60.

Example No.	Acid Resistance	Scratch Resistance (residual gloss, %)
1	13	70
5	22	68
6	22	70
11	14	80

4. As can be seen from the table acceptable acid and scratch resistance results were obtained for Examples 1, 5, 6, and 11, all where the hydroxy-C2-C4-alkyl (meth)acrylate component was changed either to hydroxyethylacrylate or hydroxypropylacrylate depending on what the original example used.

5. I conclude that the acceptable acid and scratch resistance demonstrated for Examples 1, 5, 6, and 11 occurs for coatings that use either hydroxyethylacrylate or hydroxypropylacrylate as the hydroxy-C2-C4-alkyl (meth)acrylate component.

6. I declare that all statements made herein are either based on my own knowledge and are true, or if based on information and belief are believed to be true. I also declare that all statements were made with knowledge that willful false statements, and the like, are punishable by either fine, or imprisonment, or both under Section 1001 of Title 18 of the United States Code, and any such willful false statements may jeopardize the validity of either the patent application, or any patent issuing thereon.

By: Carmen Flosbach  
Carmen Flosbach, Ph.D.

Dated: July 28<sup>th</sup> 2006

<sup>1</sup> See DFO proceedings 32, pages 59 to 66, technology seminars, proceeding of the seminar on 29-30.4.97 in Cologne, published by Deutsche Forschungsgesellschaft für Oberflächenbehandlung e.V., Aderstrasse 94, 40215 Düsseldorf.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

JAN 2 2008

RE APPLICATION OF:  
**CARMEN FLOSBACH, ET AL.**

APPLICATION NO.:  
**10/782,098**

FILED:  
**FEBRUARY 19, 2004**

FOR:  
**PROCESS FOR PRODUCTION OF  
POLYURETHANE DI(METH)ACRYLATES**

GROUP ART UNIT:  
**1711**

EXAMINER:  
**RABON A. SERGENT**

ATTORNEY DOCKET NO.:  
**FA 1224 US NA**

**DECLARATION UNDER 37 C.F.R. § 132**

COMMISSIONER FOR PATENTS  
P.O. Box 1450  
ALEXANDRIA, VA 22313-1450

Sir:

I, Carmen Flosbach, declare that:

I am a citizen of the Federal Republic of Germany and reside at Marpe 41 D-42287 Wuppertal, Federal Republic of Germany.

I am an employee of E.I. du Pont de Nemours and Company ("DuPont").

I received a Ph.D. in organic heterocyclic chemistry from the University of Wuppertal, FRG. I have worked for DuPont from 1990 to the present in the field of resin development.

I am a technical expert in the field of paint coatings, and I am familiar with the above-referenced patent application, as well as the references cited therein.

The following are my remarks:

1. The December 19, 2005, Office Action indicated that Claims 1-10 were rejected under 35 U.S.C. § 103(a) as unpatentable over WO 01/25359 (which corresponds to U.S. Patent 6,825,241), to Blum, et al. (*hereinafter "Blum"*), as obvious.
2. Attached hereto are experiments demonstrating unexpected and superior "Acid Resistance" and "Scratch Resistance" results of coatings made from the compositions of the present invention.
3. The experiments were performed under my instructions as follows:  
Acid and the scratch resistance of the powder coatings of Examples 1-to 8 and Example 11 of the present application were determined. The respective powder clear coats were sprayed, in a layer thickness of 80 $\mu\text{m}$  in each case, onto steel sheets coated with commercially available electro-deposition paint, filler and base coat (flashed off) and melted for 10 min at 140°C (oven temperature). The coating was cured by ultra-violet radiation corresponding to a radiation intensity of 500 mW/cm<sup>2</sup> and a radiation dose of 800 mJ/cm<sup>2</sup>.

(i) Acid Resistance Test

50  $\mu\text{l}$  of 36% sulfuric acid were dropped onto the paint films for 30 minutes, at intervals of one minute, at 65°C.

Assessment: Destruction of the film after X (0 to 30) minutes.

(ii) Scratch Resistance Test

Scratch resistance was determined in terms of residual gloss after wash scratching. Residual gloss was measured in percent (ratio of initial gloss of the clear coat surface to its gloss after wash scratching; gloss measurement in each case was performed at an angle of illumination of 20°). Wash-scratching was performed using an Amtec Kistler laboratory car wash system [c.f. Th. Klimmasch and Th. Engbert, Entwicklung einer einheitlichen Laborprüfmethode für die Beurteilung der Waschstraßenbeständigkeit von Automobil-Decklacken] according to development of a standard laboratory test

method for evaluating resistance of automotive top coats to car wash systems.<sup>3</sup>

For comparison purposes, the resin according to Example 5 of WO 01/25359 was also prepared. Using this resin, a powder coating was prepared and applied according to the method used for Examples 1-11. Acid and the Scratch resistance were determined as described above. Acceptable Acid Resistance number was greater than 10. Acceptable Scratch Resistance number was greater than 60.

Example No.	Acid Resistance	Scratch Resistance (residual gloss, %)
1	12	72
2	13	68
3	11	71
4	12	69
5	23	64
6	21	70
7 (comparison)	10	75
8 (comparison)	22	60
11	13	82
Example 5 of WO '359 (comparison)	9	75

4. As can be seen from the table, acceptable acid and scratch resistance results were obtained only in case of Examples 1-6 and 11. The comparative examples show either poor acid resistance (values of  $\leq 10$ ) or poor scratch resistance (values of  $\leq 60$ ). Particularly, Example 5 of Blum showed a poor Acid Resistance number of "9".
5. I conclude that the Examiner's position in the December 19, 2005, Office Action, vis-à-vis the obviousness rejection based on 35 U.S.C. § 103(a) is untenable because the coating compositions of the present invention provide with an unexpected and superior result in terms of Acid Resistance and Scratch Resistance of such coatings.

<sup>3</sup> See DFO proceedings 32, pages 59 to 66, technology seminars, proceedings of the seminar on 29-30.4.97 in Cologne, published by Deutsche Forschungsgesellschaft für Oberflächenbehandlung e.V., Adersstraße 94, 40215 Düsseldorf

6. I declare that all statements made herein are either based on my own knowledge and are true, or if based on information and belief are believed to be true. I also declare that all statements were made with knowledge that willful false statements, and the like, are punishable by either fine, or imprisonment, or both under Section 1001 of Title 18 of the United States Code, and any such willful false statements may jeopardize the validity of either the patent application, or any patent issuing thereon.

DATED: February 24<sup>th</sup> 2006

By: Carmen Flosbach  
CARMEN FLOSBACH, PH.D.



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Application No.: 10/782,098

Filing Date: February 19, 2004

First Named Inventor: Carmen Flosbach

Title: Process for the Production of Polyurethane Di(Meth)Acrylates

Attorney Docket: FA1224 US NA

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